

## CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method for conditioning a recipient for bone marrow transplantation comprising subjecting said recipient to a composition that specifically depletes  $\alpha\beta^-$ , and  $\gamma\delta^-$  TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic microenvironment, followed by a delayed transplantation with a donor cell preparation containing hematopoietic stem cells from a donor that are matched at the major histocompatibility complex class I K locus with the recipient hematopoietic microenvironment.
2. The method of claim 1 in which said composition comprises antibodies specific for  $\alpha\beta^-$ , and  $\gamma\delta^-$  TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells.
3. The method of claim 1 in which said composition comprises antisense DNA that is directed against the precursors of  $\alpha\beta^-$ , and  $\gamma\delta^-$  TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells.
4. The method of claim 3 wherein antisense DNA alters the translation of the  $\alpha$ -chain,  $\beta$ -chain,  $\gamma$ -chain, or  $\delta$ -chain of TCR<sup>+</sup> T cells.
5. The method of claim 3 wherein antisense DNA alters the transcription of the  $\alpha$ -chain,  $\beta$ -chain,  $\gamma$ -chain, or  $\delta$ -chain of TCR<sup>+</sup> T cells.
6. The method of claim 1 in which said composition a cytotoxic drug specific for  $\alpha\beta^-$ , and  $\gamma\delta^-$  TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells.
7. The method of claim 1 wherein the recipient is further conditioned by subjecting the recipient to a total dose of total body irradiation of less than or equal to 300 cGy.
8. The method of claim 1 wherein the recipient is further conditioned by subjecting the recipient to an alkylating agent.
9. The method of claim 8 wherein said alkylating agent is cyclophosphamide.
10. The method of claim 1 wherein said composition specific to  $\alpha\beta^-$ , and  $\gamma\delta^-$  TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic

microenvironment totally eliminates said cells from the recipient hematopoietic microenvironment.

11. The method of claim 1 wherein the delay of transfusion is a period of time between 0 and 8 days.

12. The method of claim 11, wherein said period of time is up to five days.

13. A method for transplanting bone marrow comprising,  
(1.) conditioning a recipient for bone marrow transplantation comprising subjecting said recipient treatment with a total dose of total body irradiation from 100 to 300 cGy, and treating the patient with a composition that specifically depletes  $\alpha\beta^-$ , and  $\gamma\delta^-$ -TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic microenvironment;  
(2.) delaying transplantation with a donor cell preparation by up to 8 days.

14. The method of claim 13 wherein the recipient is further treated with an alkylating agent before, during, or after exposure to said composition that specifically depletes  $\alpha\beta^-$ , and  $\gamma\delta^-$ -TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic microenvironment.

15. The method of claim 14 wherein said alkylating agent is cyclophosphamide.

16. A method of partially or completely reconstituting a mammal's lymphohematopoietic system comprising administering to the mammal a composition that specifically depletes  $\alpha\beta^-$ , and  $\gamma\delta^-$ -TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic microenvironment, followed by a 0 to 8 delay of transplantation with a donor cell preparation containing hematopoietic stem cells from a donor that are matched at the major histocompatibility complex class I K locus with the recipient hematopoietic microenvironment.

17. The method of claim 16, in which the mammal suffers from autoimmunity.

18. The method of claim 17 in which the autoimmunity is diabetes.

19. The method of claim 17, in which the autoimmunity is multiple sclerosis.

20. The method of claim 17, in which the autoimmunity is sickle cell.

21. The method of claim 17, in which the autoimmunity is anemia.

22. The method of claim 17, in which the mammal suffers from a hematologic malignancy.

23. The method of claim 16, in which the mammal requires a solid organ or cellular transplant.

24. The method of claim 16, in which the mammal suffers from immunodeficiency.

25. The method of claim 16, wherein said delay is up to 5 days.

25. A method for conditioning a recipient for bone marrow transplantation comprising subjecting said recipient treatment with a total dose of total body irradiation from 100 to 300 cGy, and treating the patient with a composition that specifically depletes  $\alpha\beta$ -TCR<sup>+</sup> T cells and/or CD8<sup>+</sup> T cells in the recipient hematopoietic microenvironment, transplanting with a donor cell preparation containing hematopoietic stem cells from a donor that are matched at the major histocompatibility complex class I K locus with the recipient hematopoietic microenvironment.

26. The method of claim 25, wherein said transplanting occurs between 0 and 8 days following total body irradiation.

27. The method of claim 25, wherein said transplanting occurs between 2 and 4 days following total body irradiation.

28. A method for conditioning a recipient for bone marrow transplantation comprising subjecting said recipient to a total dose of total body irradiation from 100 to 700 cGy, and infusing the recipient with a donor cell preparation containing hematopoietic stem cells from the donor between 0 and 8 days following total body irradiation.

29. The method of claim 28, wherein said dose of total body dose irradiation is from 100 to 500 cGy and infusion occurs between 1 and 5 days following total body irradiation.

30. The method of claim 28, wherein said dose of total body dose irradiation is from 100 to 300 cGy and infusion occurs between 1 and 3 days following total body irradiation.